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ABSTRACT

The multiple role of the government legislator necessitates the constant evaluation of relevant and diverse information for effective decision-making, and requests for direct access of information have resulted in the use of video screen terminals and online computer services. Computerized bibliographic files augment traditional information support by executive branch subject specialists and libraries. Congressional support of the coordinated development of technology-supported information systems has resulted in legislative branch information resources covering many aspects of governmental decision-making. State legislators have information needs similar to those of Congress; they could also benefit from an increased use of computer technologies. Advantages and disadvantages of applying computer technology to identifiable legislative activities must be considered when developing new information services. However, the effectiveness and responsiveness of any such information system will depend basically upon the managerial competence and political astuteness of those who establish the policy and procedures governing its operation. (CWM)

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THE LEGISLATOR AS USER OF INFORMATION TECHNOLOGY

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I. INTRODUCTION

Perhaps at no point in the history of the Republic has the need of senior governmental decision-makers for useful information been more acute. The 1970 decade has been characterized by an unprecedented array of critical domestic problems -- air and water pollution, transportation snarl, crime prevention and administration of justice, housing for the nonaffluent, and substandard education and welfare services -- which require measured judgment by officials at all levels of Government.

Within the Congress, functioning under a charter established long ago, the search for greater efficiency and effectiveness has been intensified in recent years. The Legislative Reorganization Act of 1970 (Public Law 91-510) provided guidance and procedures in certain key areas, including an emphasis on types of information support essential to the legislative and administrative operations of the Congress. For instance, budgetary and fiscal data, so critical to the congressional oversight role, would be collected and maintained in an executive branch computer-supported system. This information resource has proven to be useful in enhancing the ability of responsible congressional elements to make "more meaningful comparisons between the costs of Federal programs and their benefits" while permitting "the extraction of many other types of specialized information about the fiscal aspects of Federal activities." 1/ More recently, as a result of the passage of the Congressional Budget and Impoundment Control Act of 1974 (P.L. 93-344), the newly created Congressional Budget Office and the two Budget Committees have begun using advanced information technology in

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1/ U.S. Congress. House. Committee on Rules. Legislative Reorganization Act of 1970. Report of the Committee on Rules on H.R. 17654. (91st Congress, 2nd session, House Report No. 91-1215, 1970). Washington, D.C., U.S. Government Printing Office, 1970. p. 11.

handling fiscal and budgetary data obtained from the Office of Management and Budget (OMB) and those derived from their own analyses.

Another thrust of the Legislative Reorganization Act of 1970 goes to the heart of Member, committee, and staff needs for the type of research and analytical support provided by the Congressional Research Service (CRS). Several new duties were defined which encompass both a refinement of analytical and advisory services and a clear implication that more carefully structured and maintained files, better tools allowing selective retrieval of needed data from those files, and the rigorous use of available advanced technology would be required to:

1. Assist committees in analyzing, appraising, and evaluating the advisability of enacting legislative proposals and alternatives thereto and estimating their probable results; maintain continuous liaison with committees.

2. Inform committees of programs and activities scheduled to expire in the current Congress.

3. Provide committees with lists of subjects and policy areas suitable for analysis in depth.

4. Upon request, prepare concise legislative histories of measures upon which committee hearings are to be held. 2/

Such "user requirements" reflect the serious thinking which has been undertaken by those seeking to ease the burdens so long carried by Members and their staffs. Above all, time is of the essence where the Member's allocation of his personal and staff resources is concerned. Fulfilling, as he does, a multiple role -- legislative conceptualist and debater, key determinant in the deliberations and recommendations of his committees and subcommittees, and ombudsman

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2/ Kravitz, Walter. The Legislative Reorganization Act of 1970: Summary and Analysis of Provisions Affecting Committees and Committee Staff of the House of Representatives. Washington, D.C., Legislative Reference Service, Library of Congress, December 28, 1970. p. 64-65.

serving his constituents -- he should be able to identify, modify as required, and periodically evaluate the information that his office must have to function effectively.

II. MEMBER INFORMATION NEEDS THROUGH A PRISM

As the busy Congressman and his staff endeavor to provide the range of services implied by this multi-faceted role, they continue to search for ways to "work smart." Always there is the need for information -- facts, quotations, statistics, citations, guidelines, pro's and con's, precedents, research summaries -- information that is accurate, as comprehensive as possible, timely where necessary, and above all, relevant. In many quarters of Government today, there are references to "the white plague," the plethora of paperwork that threatens to engulf the bureaucrat, the top echelon decision-maker, and the populace at large.

Senators and Representatives have enunciated on numerous occasions, both informally and in survey interviews, their awareness of the "information problem." For the most part, they stress that the problem is not one of lacking specific information, although that obviously may arise from time to time. More often, the dilemma is which information to use, how to screen out the spurious or less useful data from the nuggets of truth. Each decision to be made is arrived at by a process which involves logic, hard facts, expert interpretation, a comparison of alternatives, political acumen, a "gut reaction," and a consideration of the real world situation as the Member sees it. How much reliance must he place upon his own staff or external resources in obtaining the information that he has to have? Indicative of the Member's incredibly diverse information needs is this typical calendar:

7:30 a.m.	Breakfast with constituent group
8:45 a.m.	Review speech draft with Administrative Assistant
9:00 a.m.	Discussion with two colleagues of terminology in a bill up for debate
9:30 a.m.	Telephone conversation with staff member in district office about pressing local problem
9:50 a.m.	Meeting with visiting constituent who has a distressing problem involving an executive branch agency

10:15 a.m.	Go over background material on upcoming subcommittee session with Legislative Assistant
10:30 a.m.	Subcommittee meeting, including appearance of witnesses requiring Member questioning
12:00 noon	Luncheon with lobbyist group representatives seeking support on approaching vote

Even the most cursory examination of this truncated schedule reveals the variety of research, staff interaction, and decision-making which must take place. And all of these actions must occur against a backdrop of "drop-in" visitors' inquiries, official and constituent correspondence, and the omnipresent telephone.

Listen to the comments of the Members themselves as they reflect upon their information needs. Their candor is an indication of the importance attached to obtaining better information. 3/

Subject	Comment
Information that is current and reliable on the content and status of proposed legislation	"I want to find out when hearings are to be held; who are the witnesses; can other witnesses be scheduled or programmed?"
Floor action on a bill	"We don't know what's going to happen on the floor. Trying to follow the whip notices, and what is happening on the floor; there is a slight difference as to what takes place."
Information about Federal grants, loans, projects, and contracts -- programs in existence, and status of individual application by constituents	"We stumble across a program that is being used badly in a district . . . The money is available but it is just sheer luck if we find it."
Information for evaluation of Federal programs, especially funding ramifications	"Congress ought to move on our [sic] own initiative to develop some sort of capacity to make our own budget analysis."
Information on the scope and nature of Federal programs throughout the country	"It is not uncommon to have to place seven or eight calls to get through to the right bureaucrat."

3/ U.S. Congress. House. Committee on House Administration. Second Progress Report of the Special Subcommittee on Electrical and Mechanical Office Equipment. Prepared by the Working Group on Automatic Data Processing for the House of Representatives. (91st Congress, 2nd session, committee print, October 1970). Washington, D.C., U.S. Government Printing Office, 1970. p. 6-9.

Great stress continues to be placed within the Congress on attaining a heightened capability for budget analysis and program evaluation. Legislative proposals introduced during recent Congresses have provided for the creation of legislative branch offices to perform these essential tasks in a way that will allow the legislators to conduct their oversight more effectively.

Just as the Member has his hour-to-hour quandary about which sets of facts to ask for, much less use, so the administrative and legislative assistants, the special caseworkers, the committee staffers also must know how to exploit their information contacts. At the Member's hurried request, these de facto information specialists must be able to ferret out the latest White House utterance, editorial comment, or recommendation by an esteemed "think tank." And such information must then be readied for the Member to use in a variety of ways: press release, comment over coffee with a colleague or in chamber debate, reflection during a "meet the press" interview, or as a possible amendment to a bill being considered in committee session. Ideally, Members would like to be given an "executive brief" in corporate parlance or a "daily estimate" as prepared for many senior military commanders. A number of Members asked the Congressional Research Service (CRS) to look into the feasibility of establishing an "issue briefing system" which would furnish the essential elements of information on a wide range of topics before the Congress. In response to these requests a computerized file, known as the Major Issues System, now features "briefs" on more than 200 active issues and makes them available as cathode ray tube (CRT) displays or in printed form.

Patterns of handling the myriad information needs of Congress and its constituents are shifting, as the volume and variety of requests proliferate. Committee staffs today find themselves occasionally being asked to fulfill Member's constituent problems. The expertise required to cope with many of the current

domestic and foreign issues often must be sought outside the Member's personal or committee staff resources. Such factors as these necessarily affect the types of persons selected for the congressional staffs, and the degree of reliance on external support groups.

Two recent developments have enhanced Members' direct access to computerized information. The Senate, working through its Committee on Rules and Administration, has facilitated placement of video screen terminals in virtually all Member offices. (See figure 1.) 4/ Thus far, 98 Senate offices are equipped with these devices which allow direct and immediate access to the CRS computerized data base that includes the Bill Digest File, the Bibliographic Citation File, and the Major Issues System. In the House of Representatives, House Order Number 23 (1975) authorized each Member to spend up to $1,000 a month out of clerk-hire funds for "computer services." More than 200 House offices now have on-line capabilities -- many having two or more terminal devices, including some located in district offices -- supporting various administrative and legislative tasks.

4/ Chartrand, Kevin C. Illustration originally appeared in U.S. Congress. Senate. Committee on Rules and Administration. Information Support for the U.S. Senate: A Survey of Computerized CRS Resources and Services. Prepared for the Subcommittee on Computer Services by the Science Policy Research Division, Congressional Research Service. (95th Congress, 1st session, committee print, January 12, 1977). Washington, D.C., U.S. Government Printing Office, 1977. p. 30, Figure 12.

Figure 1

Congressional Videoscreen (CRT) Terminal Station

III. UTILIZATION OF EXTERNAL INFORMATION SERVICES

As the Congress has come to realize that it no longer can depend solely upon its in-house staffs and some of the traditional information resources elsewhere in Government and the private sector, a twin-pronged effort has been initiated to ensure acquisition of even better information. Information systems groups skilled in the use of computer and microform technology have been created within the House and Senate, and are offering such services or products as electronic voting (in the House), addressing and mailing (in the Senate), legislative calendar preparation, storage of campaign expenditure data, bill status information, and voting record information. But in addition, a major look is being taken at what exists in the Federal executive branch and beyond.

The Members and committees of the Federal legislature always have funneled many types of requests to the Federal executive establishment. In the volume, Both Your Houses, the author points out that:

> . . . ready access to legitimate facts on the costs and performance of the Defense Department can be of incalculable value to an increasingly questioning Congress, which will have to be on the alert for any attempt to cloak routine information with a security blanket. 5/

An inquiry from a Congressman to the executive branch usually is routed through designated liaison officers who will seek to expedite responses. Regardless of the effectiveness of this channel, however, the Congressman who would demand for himself or his committee salient budgetary or planning information must be prepared to do certain things:

5/ Weaver, Warren, Jr. Both Your Houses: The Truth About Congress. New York, Praeger Publishers, 1972. p. 172.

1. he must define very precisely his information requirements;

2. he must see that compatible formats and procedures for accepting, transmitting, and utilizing the data are prepared;

3. he must have available to him those devices and staff capabilities which will allow him to use the data from the executive branch; and

4. he must be able to guarantee, through a system of protective legal and data processing procedures, the confidentiality of the incoming information, where that is a factor in its being made available. 6/

With the advent of computerized data bases, many agencies and departments have established a special type of "upon request" service. As may be imagined, the kinds of action enumerated above become particularly critical when attempting to procure and use computer-generated products. It is not enough simply to obtain, for example, the magnetic tape containing a given file. One must also make sure that the automatic data processing (ADP) configuration to be used is compatible with that for which the data was originally designed to be processed, and that the "software" (computer program) is available to direct the machine in its step-by-step manipulation of the data.

Computerized repositories of subject data are on the increase, and many of these are proving to be of worth to the Congress. Concerned congressional elements seeking assistance in deriving legal type information can turn to the United States Air Force Project FLITE (Federal Legal Information Through Electronics), in Denver, which allows a search of such material as the full text of the U.S. Code and the published Comptroller General's decisions. A similar service, known as JURIS (Justice Retrieval and Inquiry System), accessible "on-line" via videoscreen terminals, is operated by the U.S. Department of Justice.

6/ Chartrand, Robert L. Congress, Computers, and the Cognitive Process. In Planning and Politics: Uneasy Partnership (Thad L. Beyle and George T. Lathrop, eds.) New York, The Odyssey Press, 1970. p. 183.

Many types of bibliographic files have been computerized. The National Library of Medicine makes available its MEDLINE Service, an on-line version of the Medical Literature Analysis and Retrieval System (MEDLARS), while the U.S. Department of Commerce has developed the National Technical Information Service (NTIS), a central source for Government-sponsored research and development reports that are described in 800,000 abstracts which may be searched for inclusion in custom bibliographies. The Federal Assistance Program Retrieval System (FAPRS), answering a long articulated need for essential information about the hundreds of domestic assistance programs, is in the final stages of on-line service development. Through the use of such "systems" as these, traditional information support by executive branch subject specialists and libraries is being augmented by special services featuring quick, selective access to priority information.

IV. LEGISLATIVE BRANCH INFORMATION RESOURCES

During the 1970's, there has been a serious and sustained commitment of resources by the Congress in the development of technology-supported information resources and services. In 1976, a total of $29,112,000 7/ was allocated for "computer systems spending" by the various legislative branch elements, and the upward trend continues.

Although a few joint efforts have been undertaken, such as the Senate-House-Library of Congress establishment of the LEGIS (Legislative Information and Status System) capability, most projects involving the use of computer and microform technology have been initiated on a single chamber basis. A Policy Coordination Group comprised of senior Senate, House, and CRS staff members has been created upon the authorization of the Senate Committee on Rules and Administration and the Committee on House Administration. Its function is to "coordinate the development of technology-supported information systems during the present and succeeding Congresses." 8/

The House of Representatives, which began its advanced information systems development in 1969, recently has separated its policy formulation and operational responsibilities. A new Policy Group on Information and Computers, chaired by Rep. Charlie Rose, performs the former task while the 210-person

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7/ Management Issues: Congressional Analytic and Information Support. A presentation before the Policy Group on Information and Computers, U.S. House of Representatives, dated January 31, 1977. Washington, D.C., McKinsey & Company, Inc. p. 7.

8/ Separate letters from Gilbert Gude, Director, Congressional Research Service, to: The Honorable Howard W. Cannon, Chairman, Committee on Rules and Administration, United States Senate; and the Honorable Frank Thompson, Jr., Chairman, Committee on House Administration, United States House of Representatives (both dated April 27, 1977). 1 p.

House Information Systems Group handles all of the information developmental and service operations.

Among the priority applications of ADP technology is the handling of bill content and status information through the on-line LEGIS capability. Begun in 1973, this "bill status system" now makes such information available to the general public, as well as to Members and congressional staffs. Originally, such data were obtained by calling a central inquiry office which obtained the needed information from computerized files. With the growth in terminal devices located in Member offices — 208 House offices reportedly had such units in mid-1977 9/ -- direct access to these files is becoming more common.

The potential for using computers in the bill drafting function first was recognized in the House Office of Legislative Counsel in the late 1960's, but positive action through a series of experiments did not ensue until the 94th Congress. The fledgling ATEX terminal-oriented composition and editing system -- installed for the purpose of publishing committee hearings using text processing and photocomposition methods -- features a single minicomputer that performs all three of the essential systems functions: editing, file management, and composition. As the system expands its configuration with additional minicomputers and multiple terminals, 96 users will be able to utilize the system concurrently. In the future, the same equipment will be used to support a bill drafting system for the Legislative Counsel.

A broad array of budget analysis and monitoring projects in support of the House Committees on the Budget and Appropriations and the Congressional Budget Office (CBO) have been developed since the passage of the Congressional

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9/ Dramatic increase shown in use of computers by House Member offices, in Information on Information, June 1977. p. 1.

Budget and Impoundment Control Act of 1974. For the most part, these systems were developed and are maintained by commercial vendors under the aegis of the House Information Systems (HIS) group. The operating programs include:

Budget Control System	Member Budget System
Budget Tracking System	Fiscal Data Base
Legislative Classification System	CBO Congressional Scorekeeping System
Project Control System	Rescissions and Deferrals

Comparative Statement of Budget Authority (CSBA)

An increasing number of computer-assisted models are used to help formulate policy alternatives, supported by such packaged programs as income modeling, statistical analysis, econometric forecasting, and income tax analysis.

A "Member Information Network (MIN)" allows Member offices access to various remote computerized files such as JURIS, FAPRS (Federal Assistance Program Retrieval System), LEGIS, and the nine information files which comprise the Library of Congress SCORPIO (Subject-Content Oriented Retriever for Processing Information On-line) system. In addition, this network provides summary accounts of House floor activities which are prepared by chamber reporters and directly inserted into the on-line "Summary of Proceedings and Debate (SOPAD)" system.

Other uses of computers by the House of Representatives include an elaborate, effective electronic voting system in the chamber, the use of terminals by 18 committees in their preparation of legislative calendars, the experimental "Member Office Support System (MOSS)" with minicomputer handling of constituent correspondence and related office tasks, and a variety of administrative functions (payroll, inventory of equipment, etc.). The potential of video technology is being assessed through a 90-day filming of House chamber activity, conducted by the House Select Committee on Congressional Operations.

Within the United States Senate, the development of technology-oriented information resources and systems is controlled by the Committee on Rules and

Administration. Official "guidelines," similar to those in effect in the House of Representatives, dictate that the committee has: 10/

> . . . authority concerning policy, organization, initiation, implementation, operation and evaluation of all matters concerned with information processing and communication as they relate to mechanization, automation, computerization, or related functions.

It should be noted that certain responsibilities are vested in the Sergeant at Arms, who controls the Senate computer center, and the Secretary of the Senate.

In fulfilling one of the recognized top priorities affecting information support -- "provide information and analysis to Senators and their staff to assist them in their legislative tasks" 11/ -- videoscreen terminals have been installed in 98 Member offices and 46 other Senate locations (e.g., committees). These units provide quick access to the SCORPIO-served files of the Library of Congress such as the much-used Major Issues System and the Bill Digest files for the 93rd, 94th, and 95th Congresses.

Several applications of information technology have been undertaken successfully during the past five years. As noted earlier, LEGIS has been developed on a joint basis with the House of Representatives and the Library of Congress. New capabilities will include the utilization of "full text

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10/ U.S. Congress. Senate. Committee on Rules and Administration. Initial report of the Subcommittee on Computer Services to the Committee. (92nd Congress, 1st session, committee print, July 21, 1971). Washington, D.C., U.S. Government Printing Office, 1971. p. 2-3 [Proposal 1]. Also see U.S. Congress. House. Committee on House Administration. Providing Funds for the Expenses of the House Information Systems of the Committee on House Administration. 95th Congress, 1st session, Report No. 95-137, March 29, 1977. Washington, D.C., U.S. Government Printing Office, 1977. 22 p.

11/ U.S. Congress. Senate. Committee on Rules and Administration. Report to the Subcommittee on Computer Services. (95th Congress, 1st session, committee print, January 3, 1977). Washington, D.C., U.S. Government Printing Office, 1977. p. v.

retrieval" programming through use of the SCORPIO software, data files featuring official information on Senators, Senate committees, and committee membership for use by the Secretaries of the Majority and Minority, and programming for a Senate meeting and hearing display system.

A series of fiscal-budgetary support capabilities exist, including providing the Senate Committee on the Budget -- through use of two vendor support systems -- with tabular data on budget targets, allocations, and ceilings, and for the same committee, producing a library of analytical reports from the OMB budget preparation tape, plus providing external (Chase Econometric, Wharton Econometric) services to Senate committee users. The Committee on Appropriations is assisted in its preparation of appropriations bill reports (by using ADP techniques) and expediting the production of tables used in bill preparation (by providing a high-speed printer).

Another milestone endeavor, designed to facilitate Member office operations, has been the pilot "Correspondence Management System (CMS)" designed to better manage the voluminous correspondence which is a severe problem in most Senate offices. A controlled test in 11 Member offices established the need for such improvements and provided data to project the costs and benefits of a fully operational system. Related to this effort has been the establishment of an "Automated Index System" which permits an office staff to store basic identification data about a document only once; subsequently the computer provides cross files on the basis of name, date, city, etc.

Several Senate committees have had special computer-based services created for them. One of the most comprehensive efforts, for the Committee on Foreign Relations, features a retrieval system that contains a collection of indexing and abstracting records on such committee documents as charters, treaties or international agreements, press releases, and reports required

by law. An overview of computer services provided to committees and other Senate units appears as figure 2. 12/

Figure 2

Computer Services Provided to Committees, Subcommittees and Other Senate Organizations, Nov. 30, 1976

	Senate	ATMS	Mail system	Budget analysis	New York Times data bank	Specialized services
Aeronautical and Space Sciences	•	•	•	••	••	
Agriculture and Forestry	•	•	••	••		
Appropriations	•	•	••	••		••
Armed Services	••	••		••		••
Banking, Housing, and Urban Affairs			••	••		••
Budget	•	•	••	••		••
Commerce	•	•	•	••	••	
District of Columbia	•	•		••		
Finance			••	••		
Foreign Relations	•	•	•	••	••	•
Multinational Corporations Subcommittee			••			
Government Operations	•	•	•	••		
Permanent Subcommittee on Investigations			••			
Intergovernmental Relations Subcommittee			••			
Interior and Insular Affairs		••		••		
Judiciary	•			••		
Improvements in Judicial Machinery			•			
Internal Security Subcommittee			••			
Separation of Powers Subcommittee			••			
Labor and Public Welfare	•	•		••		••
Post Office and Civil Service			••	••		
Public Works	•	•	••	••		
Rules and Administration				••	••	••
Computer Services Subcommittee	•	•	•	••		
Veterans' Affairs	•	•	••	••		
Select Committee on Small Business	•	••				
Select Committee on Standards and Conduct		••				
Select Committee on Nutrition and Human Needs			••			••
Select Committee to Study the Senate Committee System		••	••	••		••
Select Committee on Intelligence	•	•				
Special Committee on Aging			••			
Joint Economic Committee	••	••	••	••		••
Secretary of the Senate	••	••				••
Disbursing Office						••
Senate Library	••	••			••	
Legislative Counsel	••					••
Sergeant at Arms	••	••	••			
Radio and TV Gallery			••			
American Indian Policy Rev Commission			••			
Congressional Budget Office			••			
Office of Technology Assessment			••			
Democratic Policy Committee	••		••		••	••
Republican Policy Committee	••				••	••
Secretary for the Majority						••
Secretary for the Minority						••
Commission on Operations of Senate						••
Total	33	22	29	21	7	18

* Installed prior to 1976.
** Installed in 1976.

12/ U.S. Congress. Senate. Committee on Rules and Administration. Report to the Subcommittee on Computer Services (January 3, 1977), op. cit., p. 3, Figure 1.

Computers, microfilm, and other technologies are employed by the Senate as it copes with massive addressing and mailing responsibilities, receives and stores Senate campaign expenditure data, records vote tallies, and performs such routine administrative tasks as those related to payroll and personnel. Experimental filming of Senate chamber proceedings and consideration of installing an electronic voting system also have occurred.

Thus, the past decade has been a time of experimentation and evaluation, of asking Members and staff personnel about their information requirements and soliciting their opinions on attempted innovations. A chronicle of key steps toward reviewing and improving congressional information support appears as figure 3.

Corollary to the development of sophisticated information files and services by the two chambers has been action within the three major legislative support elements -- General Accounting Office (GAO), Government Printing Office (GPO), and Library of Congress -- both to develop improved information systems and utilize where possible existing external resources that could enhance congressional operations.

Figure 3

Chronicle of Key Steps Toward Improved Congressional Information Support

1965-1966	Second Legislative Reorganization Act hearings
1966	First bill to create a congressional computer facility (H.R. 18428, 89th Congress)
1967	CRS automates "Bill Digest" information
1968	CRS computerizes first House calendar operation
1969	House acts on Brademas resolution by empowering Special Subcommittee on Electrical and Mechanical Office Equipment to study ADP uses
1970	Passage of Legislative Reorganization Act of 1970 (Public Law 91-510)
	Senate establishes Subcommittee on Computer Services; authorizes study of ADP uses
1971	House Information Systems office created
	Potter administrative survey of offices of the Secretary of the Senate issued
1972	House and Senate campaign expenditure data systems implemented
	New House chamber voting procedures approved
	GAO "Budgetary and Fiscal Information Needs of the Congress" published
	Technology Assessment Act of 1972 creates OTA (Public Law 92-484)
	Library of Congress ISO begins SCORPIO development
1973	Senate commences "pilot" test of CRS on-line files
	House electronic voting system becomes operative
	CRS and Senate tie in to New York Times Information Bank
	CRS establishes links with MEDLINE and JURIS systems
1974	Congressional Budget and Impoundment Control Act of 1974 (Public Law 93-344) creates CBO and chamber Budget Committees
	House Select Committee on Committees makes recommendations (H. Res. 988)
1975	House Commission on Information and Facilities establishes "pilot member information network"
	Senate provides terminals for all Member offices
	House Committee Order No. 23 authorizes $1,000 monthly expenditure (from clerk-hire funds) by each Member for computer services
	Temporary Commission on the Operation of the Senate established
1976	Temporary Select Committee to Study the Senate Committee System created
	House Commission on Administrative Review formed
	Expansion of Senate, House, and Library of Congress computer capabilities
1977	House Policy Group on Information and Computers established
	Trial videotaping of House chamber proceedings by Select Committee on Congressional Operations
	Policy Coordination Group authorized by Committee on House Administration and Senate Committee on Rules and Administration

The General Accounting Office's "watchdog" role is well-known, and in recent years the thoroughness of its detailed and sometimes massive analyses of governmental operations often has been sharpened by the use of computers in processing key statistical data. With the strengthening of the Program Analysis Division of the GAO, less reliance has had to be placed upon utilizing industrial or other governmental analytical capabilities. Strenuous efforts have been made to implement the requirements relating to budgetary and fiscal information contained in the Congressional Budget and Impoundment Control Act of 1974 and the earlier Legislative Reorganization Act of 1970, 13/ which called for the creation of a "standardized information and data processing system," "standard classifications of programs, activities, receipts, and expenditures of Federal agencies," and making available to committee or joint committees "information as to the location and nature of data available on such Federal agencies" and related summary tables of such data. There is continuing discussion concerning the establishment of a "congressional watch center" where key narrative and graphic data on program and budget matters could be retrieved and displayed for Member and staff viewing. (See figure 4.)

13/ An act to improve the operation of the legislative branch of the Federal Government and for other purposes. Public Law 91-510, 91st Congress, H.R. 17654, October 26, 1970. p. 28-29.

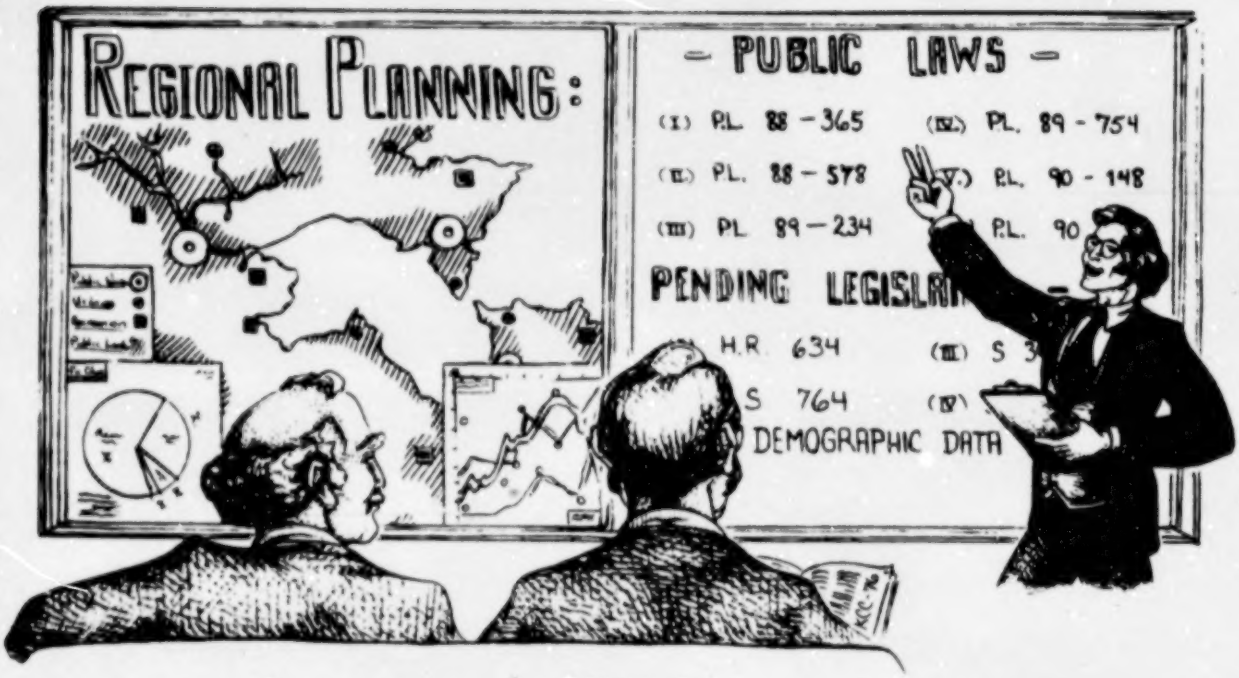

Figure 4

Projected Congressional Watch Center

The Government Printing Office, faced with ever-mounting production demands, has continued to modernize its facilities. Increasingly, such devices as the new Videocomp equipment and the slightly older LINOTRON system, a "high-speed phototypesetting device which operates off-line to a computer from magnetic tape inputs," 14/ are combined with special software -- e.g., the Master Typography Program -- to expedite the production of certain types of materials. Two general guidelines dictate which classes of work are most susceptible to this system: 15/

14/ U.S. Government Printing Office. Electronic Composing System: A Guide for its Utilization. Washington, D.C., U.S. Government Printing Office, 1966. p. 6.

15/ U.S. Congress. House. Select Committee on Committees. The Congress and Information Technology. Prepared for the Select Committee by the Science Policy Research Division, Congressional Research Service. (93rd Congress, 2nd session, committee print, May 5, 1974). Washington, D.C., U.S. Government Printing Office, 1974. p. 179.

1. Data which are already, of necessity, being processed on ADP equipment and must be printed in high volume.

2. Data to be printed in volume and which could be handled advantageously through the use of computer processing.

Advanced capabilities continue to be integrated into GPO operations, including new ADP peripheral units, optical character recognition (OCR) devices, and automatic indexing approaches. Today, more than half of the GPO output is in non-hot type form, with especial emphasis on electronic photocomposition production.

The Congressional Research Service (CRS) of the Library of Congress, a fixture on Capitol Hill since 1914, has broadened its non-partisan research and reference services to include more in-depth support of committees and the placement of timely data -- showing, for example, where bills and resolutions are in the legislative process -- in computerized files. The nine SCORPIO-served files now may be accessed by more than 700 terminals located within the legislative branch. As early as 1968, content and status information on all newly introduced legislation for both the House and Senate were stored in the Library's computer. While initial emphasis was placed on using special typewriter terminals to input, recall, and edit these data for later GPO publication in the Digest of Public General Bills and Resolutions or the CRS multilithed periodical entitled Major Legislation of the 95th Congress, there is now also an optional "on-line" service commonly referred to as the Bill Digest File, which provides this information directly to legislative branch elements via a video-screen network.

Other CRS major services to the Congress, utilizing computer support, include the Major Issues System (described above) and the Bibliographic Citation File which provides a current awareness of recent literature acquisitions. Each week, descriptive cards are sent to users on the basis of "profiles" consisting of interest terms selected by congressional user clientele. Then, if

a congressional office staffer wishes to see the full text of certain documents, a request to that effect will be honored by CRS. Gradually, system improvements have resulted in making such bibliographic data available as a videoscreen presentation at user sites. In providing "out-of-house" services to the Congress, the CRS also is bringing the resources of the private sector to Capitol Hill. Several multipurpose videoscreen terminals now link CRS and its two Chamber Reference Centers to the New York Times Information Bank. Quickly accessible to researchers are special writeups on news and feature items appearing in the Times from 1969 to the present, plus selected coverage since 1971-1972 from nearly 70 other newspapers and magazines. A recent addition is the computerized version of the Congressional Record, available for on-line searching by noon of the day of publication.

Several private firms have established data bases which are utilized by CRS, and are of proven value to the Congress. Recognized as a valuable aid to committees and Members alike is the Congressional Information Service "CIS/Index," which abstracts and indexes hearings, reports, committee prints, and other congressional papers. In addition to the 10,000 abstracts issued on a monthly basis, all public laws enacted during a Congress are described (with legislative histories). Microfiche copies of all original documentation treated in the "Index" are maintained in a special library. The types of information access offered by the New York Times Information Bank and other non-governmental systems such as the SDC Search Service and the Lockheed DIALOG information retrieval service -- both featuring multiple file, on-line products -- have helped raise the level of awareness and acceptance of modern information technology as it is applied to congressional operations. In his book, Congress and the New Politics, Dr. John S. Saloma correctly predicted that:

> . . . Congress is a relatively open system, and it is unlikely to escape such fundamental changes as the computer will introduce in American society, social organization, and education itself. 16/

As the Members' perception of what information might be available to them, and in what forms, improves, certain decisions can commence to be made regarding source selection. Timeliness of the data in any system, whether computerized or not, and the depth of coverage provided may sharply limit the options open to congressional committees and Members needing selected narrative and statistical information. In some instances, where definitive material could be recovered and synthesized if time were no factor, the Congressman may have to accept less perfect information with which to make his decision. And while many of the traditional periodicals such as the Congressional Quarterly and the National Journal still are used heavily, congressional aides look longingly at any service which allows them optimum flexibility in "browsing" through and selectively retrieving from a given collection of information.

16/ Saloma, John S. III. Congress and the New Politics. Boston, Little, Brown and Company, 1969. p. 245.

V. STATE LEGISLATURE USE OF COMPUTER TECHNOLOGY

The Congressman's impatience with the shortcomings of the information system supporting him often stems from an awareness of technological achievements, no matter how distorted in the popular literature, contact with people in "the industry," or experience in a State legislature where computers have been employed. Federal and State legislators perform many identical or similar functions, hence sharing a need for:

- Assembly of salient facts and data, independently developed, accurate, as complete as possible, of maximum currency, and readily available for use.
- Access to and an understanding of the executive branch planning, budgeting, and program performance data required for effective review of governmental operations.
- Assistance in analysis of policy problems, which requires the additional capability to assess and apply policy-relevant information.

The contemporary State legislator must be knowledgeable in many areas, with an appreciation of problems of regional, statewide, or local importance. In most States the growing legislative workload has resulted in longer sessions, permanent staff expansion, improved pay for the legislators, and significantly increased use of consultants. By 1977, all but three of the State legislatures had successfully applied computer technology to one or more key legislative functions. Ten legislative applications involve significant employment of computer technology, and each of these should be of high interest to the Federal legislator:

1. Bill drafting and statutory revision
2. Statutory retrieval
3. Status of pending legislation
4. Legislative histories
5. Index of pending legislation
6. Digest of bill contents
7. Fiscal-budgetary information
8. Legislative printing
9. Electromechanical or electronic voting
10. Political redistricting

There is a realization on the part of many Congressmen that lessons could be learned and benefits derived from the States' investments in these priority applications areas. In 1972, the Joint Committee on Congressional Operations commissioned the Congressional Research Service to prepare a detailed analysis entitled "Modern Information Technology in the State Legislatures." 17/ This study identified the alternative paths the States have followed in developing and managing their new information capabilities. It was recognized, of course, that Congress' requirements for information systems and services differ from those of the State legislatures, just as the requirements vary from State to State. But it was believed that this type of 50-state survey could point up the benefits and limitations discovered in the use of the technology by the States. The most recent survey of State legislature use of various information technologies -- computers, microfilm, telecommunications, audio, and video -- conducted by the CRS for the House Commission on Information and Computers, indicates the following growth in selected computerized applications during the past five years: 18/

17/ U.S. Congress. Joint Committee on Congressional Operations. Modern Information Technology in the State Legislatures. Prepared by the Automated Information Services Section, Congressional Research Service, Library of Congress. (92d Congress, 2d session, committee print, June 9, 1972). Washington, D.C., U.S. Government Printing Office, 1972. 137 p.

18/ U.S. Congress. House. Commission on Administrative Review. Information Support for the State Legislatures: The Role of Information Technology. Prepared by the Science Policy Research Division, Congressional Research Service, Library of Congress. (95th Congress, 1st session, October 1977). Washington, D.C., U.S. Government Printing Office, 1977. p. 24.

Legislative Applications	Operating		Under development/ planned	
	1972	1977	1972	1977
Bill drafting and statutory revision	11	31	18	5
Statutory retrieval	25	35	11	3
Status of pending legislation	25	36	10	2
Fiscal-budgetary information	20	15	6	4
Legislative printing	10	27	14	4
Electromechanical/electronic voting	35	44	1	1
Political redistricting 19/	19	23	-	-

As the comments and supporting factual data were derived from the discussions with and material provided by key State legislative officials and their technical (systems development) staff, it became apparent that virtually all of the caveats, admonitions, and guidelines which have been raised in the several explorations of how the Congress should proceed with its evolution of advanced information services were encountered as well by State system developers.

19/ Chartrand, Robert L. Redistricting in the 1970's: the Role of the Computer. Law and Computer Technology, v. 5, May-June 1972: 72-73.

VI. DEVELOPING NEW INFORMATION SERVICES: A RATIONALE

In the years since the Second World War, when planning and implementing sophisticated information systems seemed to require the creation of a new cult of technocrats, accompanied by often drastic revisions in the thinking of managers and operating personnel everywhere, a great deal of sober experience was gained about this process. Regardless of the approach employed — working within the grand strategy of a "total system" or developing individual applications piecemeal without reference to such a master plan — it became de rigueur that successful installation and use of the new tools and techniques would require, at a minimum, the following:

- Recognition that three distinct elements within the legislature must be accommodated: the leadership, standing and ad hoc committees, and the individual Members.
- Willingness on the part of key leadership to explore alternative approaches to improving a given legislative service or function.
- Establishment of a legislative oversight group (either a "commission," "task force," or "committee") to determine specific needs of individual legislators, committees, or leadership.
- Recruitment of a professional staff, responsible to the legislature, to provide the necessary technical support for information system modification.
- Establishment by the legislative oversight group of priorities for activities requiring improvement.
- Analysis in detail of alternative ways of providing better legislative support, whether through adjusting manual procedures or using computer and microform technology.
- Experimentation with a "pilot" project — in a top priority area — to permit management to assess technological feasibility and user reaction.
- Evaluation of the "pilot" project prior to any decision to develop a fully operational system.

In summarizing the advantages and disadvantages connected with applying computer technology to identifiable legislative activities, it must be stressed

that the effectiveness and responsiveness of any such information system will depend basically upon the managerial competence and political astuteness of those who establish the policy and procedures governing its operation. If Members or staff complain that a given service or product is not being delivered within the time frame or form required, then most likely the fault lies not with the "machine," but with those who have designed and are responsible for operating the system.

In establishing a list of pro's and con's for using automatic data processing, the experience derived from developing congressional as well as State legislature applications has been emphasized, but for the most part such considerations will occur in the "automation" of any similar business or governmental information system. The following listing, while not all-inclusive, should prove helpful to those who must determine the role of computer technology in creating useful information systems. 20/

Advantages	Disadvantages
1. High-speed arithmetical processing of selected data.	1. Limitations, at times, on form in which data are stored.
2. Flexibility in storage of key data: on cards, disk, tape, drum, with possible tie-in to microform.	2. Immediate visual access to certain data may be delayed due to retrieval procedures.
3. Selective retrieval of narrative or graphic material, in display or print-out form at a user (on-line) station or the ADP center.	3. Retrieval may be constrained due to software limitations, placing an increased burden on the user to think of "proper" key terms.
4. Cost savings, particularly in reducing clerical tasks and preparation of copy for printing.	4. Increased costs for quick-response service may not be justifiable in the light of user needs.

20/ U.S. Congress. House. Select Committee on Committees. The Congress and Information Technology, op. cit., p. 218.

Advantages (cont.)	Disadvantages (cont.)
5. ADP offers capability to "massage" preselected data at various levels of aggregation, and can produce multiple correlative options.	5. "Soft" (inexact) data may be arbitrarily excluded from consideration because of automatic data processing limitations.
6. Rapid fulfillment of users' requests may allow improved committee and Member functioning; also allows iterative "homing in" on a difficult question.	6. "Instantaneous" access to data may upset the "measured" procedures traditional within the legislature; electronic voting tends to create similar perturbations.
7. Decision-makers are more easily provided with critical data which may be presented in various "sets" (combinations).	7. Once data elements are decided upon and a routine established for their ADP conversion, it may be difficult to change the modus operandi.
8. As the top decision-making level learns how to use the ADP tool, new demands for more sophisticated data presentations may result.	8. If the decision-makers are to be limited to ADP-type "thinking," bad judgments may result from having insufficient or imbalanced data.

In summary, the legislator who is a user of information systems -- simple and advanced, present and future -- can never be a passive recipient of the products and services emanating from such systems. In his own way, directly and through his staff, he will be instrumental in molding the structure, operation, and responses of these information support mechanisms. For if useful information is to be provided the Congress, the "customers" of any system must dominate the "feedback loop," without which its service will founder. It has been proven that there is a role for this technology to play within the legislative milieu -- it remains for the legislators themselves to delineate the precise nature and scope of this critical support, and determine the level of resources requisite to its attainment.

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